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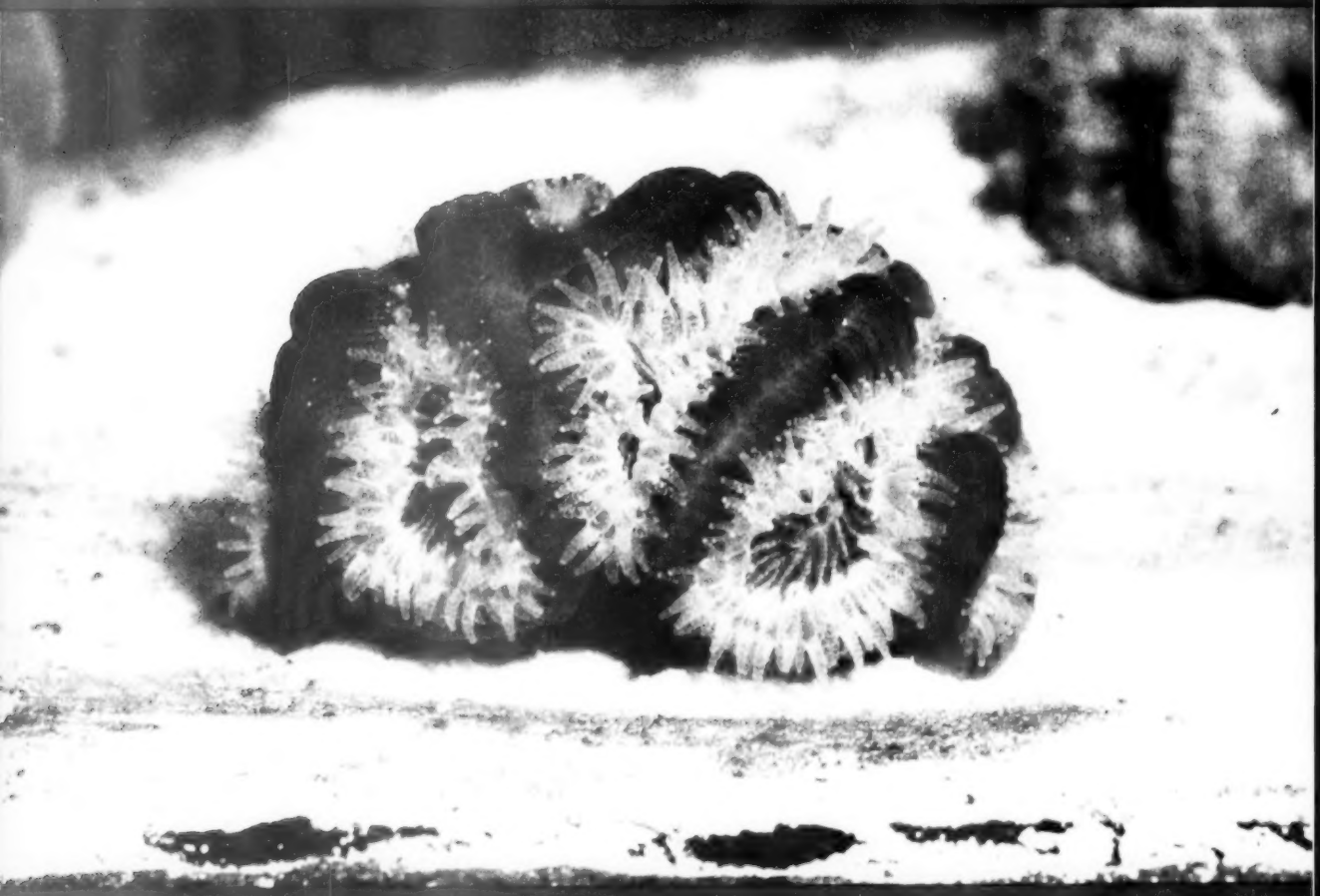
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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PHYSICS

Find Rare Pi Decay

Experimental proof that a pi meson decays directly into an electron, found by an international team of scientists, confirms theory concerning its behavior.

➤ THE DIRECT BREAK-UP of the nuclear particle known as a pi meson into an electron has been found by an international team. The physicists used the 600,000,000 electron volt particle accelerator, a synchrocyclotron, at CERN, the 13-country cooperative nuclear research center in Geneva.

The two high energy accelerators at CERN, one of which is still under construction, were planned specifically to study the properties and interactions of the so-called elementary particles, one example of which is the neutron of atomic bomb fame. Another is the pi meson, which was discovered in 1947 by the tracks it left in photographic emulsions exposed to the cosmic rays that continually bombard earth from somewhere in space.

The pi meson was observed to decay, or break up, in about a hundred-millionth of second into a mu meson. The mu meson itself decays in about a millionth of a second into an electron.

Not long after the discovery of the pi meson, it was predicted on very simple and straightforward grounds that every so often the pi meson should decay directly into an electron, instead of by way of a mu meson. The prediction was that this direct decay should occur once in every 10,000 break-ups.

Experiments at the Universities of Columbia and Chicago searching for these rare, direct decays resulted in no observations of such a process. The tests further showed that, if direct decay occurred at all, it must be less than once in every 100,000 decays.

The discovery, two years ago, that parity was not conserved in certain processes in nuclear physics, produced a very great simplification in scientists' understanding of nuclear reactions. One of the major difficulties still remaining was the negative result concerning the electron decay of the pi meson.

Several groups of physicists throughout the world therefore searched again for the direct decay, and the CERN group was successful. Studies by the CERN physicists not only demonstrated that this decay occurs, but possibly with about the expected frequency.

The group responsible illustrates the international character of CERN laboratory, since it consists of T. Fazzini and G. Fidecaro from Italy, A. W. Merrison from the United Kingdom, H. Paul from Austria and A. V. Tollestrup from the United States.

Science News Letter, October 18, 1958

GEOPHYSICS

Sun's Activity High During Current IGY

➤ THE SUN'S ACTIVITY has been the highest in history during the current International Geophysical Year.

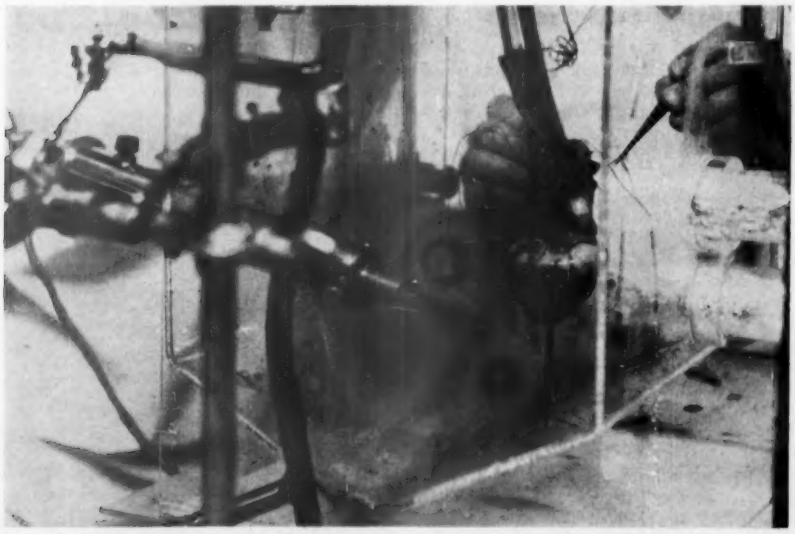
Final figures are not yet available, but preliminary calculations show that the sun reached the highest point in the sunspot cycle in November, 1957.

The International Geophysical Year (IGY), was scheduled from July 1, 1957, to Dec. 31, 1958, to include the period of maximum solar activity. The sun has cooperated by engaging in the greatest sunspot activity ever recorded.

The sun signaled its cooperation in the IGY by bursting forth in a great solar flare on June 28, 1957. Particles flung spaceward from this giant eruption started arriving at the earth two days later, in time to usher in the IGY with brilliant displays of northern and southern lights.

The smoothed sunspot number for last November was 202.2, rivaled closely last February by 201.4. Not until year's end will scientists know during which month between November and February the maximum was reached. (See SNL Dec. 7, 1957.)

Science News Letter, October 18, 1958



ISOLATED HEART—An isolated animal heart is able to be kept alive for 18 hours while researchers study the heart itself. This eliminates the other influences of the body.

CARDIOLOGY

Isolated Heart Kept Alive 18 Hours to Study Muscle

➤ ONE OF heart surgery's most dangerous problems has been solved.

An isolated animal heart, free from the influences of the rest of the body, was kept alive for 18 hours in order to study the heart muscle more easily.

The heart was kept alive by connecting it with the circulatioin of a donor dog, Drs. Baruch Bromberger and Paolo Caldini, both of the cardiopulmonary laboratory of the National Jewish Hospital at Denver, said.

While the heart was suspended for observation, the team studied ventricular fibrillation, the quivering of the heart muscle that fails to pump blood to the body because there is no coordinated contraction of the heart. This condition poses one of the greatest dangers of heart surgery. It often occurs in heart surgery performed under hypothermia, and is sometimes fatal.

They had noted that the level of magnesium ions in the blood returning from the heart was lower during hypothermia, indicating an increased concentration of magnesium in the cold heart.

By injecting exact measurements of magnesium into the isolated heart, they found that only a minute amount of magnesium was enough to cause ventricular fillibration, even at normal temperatures.

Under hypothermia, the tests were even more enlightening. The heart's tolerance for magnesium was 50% less than at normal temperatures.

They tested a drug nicknamed TEA. In repeated experiments, both with the isolated heart and with intact animals, TEA allowed defillibration.

The investigating team tested several disputed drugs to establish their effects upon the heart muscle itself. Among those drugs tested were norepinephrine, a blood pressure raiser, and quinidine hydrochloride, a reducer of heart beat. Subsequently they discovered that tetraethylammoniumchloride, or TEA, coupled with electric shock, could eliminate the danger of fibrillation during hypothermic surgery.

Dr. Bromberger reported his experiments at the recent World Conference on Cardiology at Brussels, Belgium.

Science News Letter, October 18, 1958

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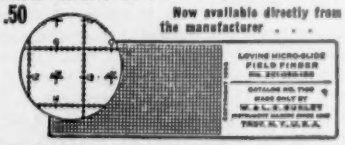

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GENERAL SCIENCE

ICSU Urges Non-Discrimination

➤ THE INTERNATIONAL COUNCIL of Scientific Unions at its Eighth General Assembly in Washington urged a policy of political non-discrimination.

In keeping with the purely scientific character of ICSU, the General Assembly approved the following statement:

"1. To ensure the uniform observance of its basic policy of political non-discrimination, the ICSU affirms the right of the scientists of any country or territory to adhere to or to associate with international scientific activity without regard to race, religion or political philosophy.

"2. Such adherence or association has no implications with respect to recognition of the government of the country or territory concerned.

"3. Subject only to payment of subscriptions and submission of required reports, the ICSU is prepared to recognize the academy, research council, national committee, or other bona fide scientific group representing scientific activity of any country or territory acting under a government, de facto or de jure, that controls it.

"4. Meetings or assemblies of ICSU or of its dependent organisms such as its special committees and its joint commissions should be held in countries which permit participation of the representatives of every national member of ICSU or of the dependent organisms of ICSU concerned, and allow free and prompt dissemination of information related to such meetings.

"5. ICSU and its dependent organisms will take all necessary steps to effect these principles."

Science News Letter, October 18, 1958

VIROLOGY

Virus Can Travel Through Dead Tissue

➤ VIRUSES that can move through dead tissue, without the help of living cells, may mean the beginning of virus disease control in plants.

Farmers may be able to control deadly plant virus diseases with chemicals as a result of studies being conducted at the U. S. Department of Agriculture's research center in Beltsville, Md. Today there are no known practical control methods using chemicals.

For the first time, USDA scientists I. R. Schneider and J. F. Worley report the movement of the virus disease, southern bean-mosaic, from dead to living plant cells. If the scientists are dealing with the smaller infectious particles of the virus, rather than the whole virus, they believe control is possible.

Previous research has shown it is possible to keep the virus particles, mostly nucleic acid, from causing disease while the whole virus is more difficult to damage.

Chemicals applied as seed or soil treatments, leaf sprays or in other ways, could inhibit movement of the infectious particles and prevent the virus's increasing in a new spot on the plant.

Control methods now consist of cutting out infected plants, developing virus-resistant strains, or controlling the insect carriers of virus diseases.

In their research the USDA scientists killed stem sections of bean plants with steam, then injected the virus into the water-conducting cells below the dead tissue. Since virus disease symptoms appeared on leaves well above the killed areas, the scientists believe small virus particles may have gone through. The virus also multiplied in the living cells.

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Edited by WATSON DAVIS

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GEOPHYSICS

Plan to Bore Ocean Hole

Facts would replace speculation concerning the earth's density, composition and age if plans to bore a three-mile deep hole in the ocean floor succeed.

➤ PLANS TO BORE a hole three miles deep in the ocean floor have been made by a special committee of the National Academy of Sciences-National Research Council, the nation's top scientific body.

The idea is to drill down through all the layers of sediment covering the ocean floor in order to get a history of the earth from its very beginning.

The plans for obtaining the earth's private diary were approved by members of the AMSOC committee, which formerly was known as the Moho Committee of the American Miscellaneous Society.

Techniques for doing the job have already been developed as part of the normal progress of oil-well drilling and rock mining. The National Science Foundation has approved a request for $30,000 to finance the first stages of operation.

Early studies made from a Pacific atoll showed this approach presented extreme difficulties, so the AMSOC committee has now decided to try drilling the three-mile hole from an ocean-going vessel. One suggestion is that the hole be dug in the Gulf of Mexico northwest of Cuba. Weather there is good and the help of scientists from oil companies drilling for offshore oil would be available.

Scientists believe there is probably no better project that would provide more information concerning the broad picture of the earth as a planet than drilling a hole through the sediments and the basalt layer and finally into the upper mantle.

Obtaining samples from such a bore hole would replace speculation by facts concerning the earth's density, composition, bulk and mineral phases, radioactivity, age and isotopic composition.

These samples would be from below the Mohorovicic discontinuity, known as the Moho, the boundary between the earth's mantle and its surface rocks. At the Moho, a very sharp change occurs in the velocity with which the earthquake waves travel.

The Moho is found at an average distance of about 20 miles below the surface under the continents, but may be as close as two and a half or three miles under the ocean floor.

The AMSOC committee, whose chairman is Dr. Gordon Lill of the Office of Naval Research, consists of Drs. Carl O. Alexis and Arthur E. Maxwell, also of ONR; Dr. Maurice Ewing, director of Columbia University's Lamont Geological Observatory, Palisades, N. Y.; Dr. Harry H. Hess of Princeton University, Princeton, N. J., and Drs. Harry S. Ladd, William W. Rubey and Joshua Tracy of the U. S. Geological Survey, and Dr. Roger Revelle, director of Scripps Institution of Oceanography, La Jolla, Calif., and Dr. Walter Munk, also of Scripps.

The over-all properties of materials through which the drill hole would pass could be measured to great advantage. For example, figures could be obtained on the temperature gradient and conductivity, and from these should come a better understanding of heat flow.

A complete sedimentary column might also show the appearance of the first life in the sea and, perhaps, a clue to its origin.

Committee members pointed out that in probing into such new and unexplored territory as a hole miles deep in the ocean floor, unexpected discoveries might play a large part in determining the final value of the work.

Drilling the hole would also give a seismic velocity log that could contribute to better understanding of earthquake waves. The magnetic properties of the materials in the hole could be determined, and various types of electric logging could be done in connection with laboratory measurements of the samples.

Knowing the magnetic properties would lead to a much better means of interpreting the magnetic anomalies at sea. The direction and sign of the remnant magnetism of the rock samples progressively down the hole could be determined, perhaps shedding some light on paleomagnetic problems.

Another question that might be answered concerns the composition of the layer immediately above the Moho discontinuity. Although it is generally thought to be basalt, there is no evidence to support this hypothesis except that the velocity of earthquake waves through this layer is appropriate. Some information might also be gained about the origin of this layer.

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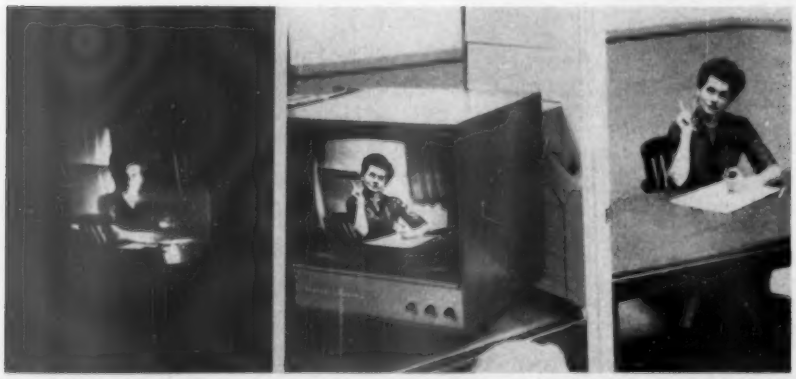

DARKNESS PENETRATED—A closed-circuit television camera developed by the General Electric Company will penetrate almost total darkness. The right half of the composite photograph was taken with normal lighting. On the left, with the lights out, the camera still transmits a picture using only the glow from a cigarette lighter.

FOOD TECHNOLOGY

Research Provides Better Food Public Demands

➤ SCIENTISTS are playing a bigger role in providing food products in the space age. An important reason for this is that Americans are becoming more nutrition-conscious.

At the same time they are asking for foods that are easier to buy, carry, store and prepare. They also want seasonal foods all year round.

These observations of Dr. Byron T. Shaw, administrator of the U. S. Department of Agriculture's Agricultural Research Service, were made at the National Association of Food Chains meeting in Chicago. Dr. Shaw said many major new methods in food processing, preservation and production were developed with USDA cooperation.

Beef cattle with more lean, tender beef, dairy cows that produce milk with more solids and less fat, potatoes with more vitamin C, and sweetcorn with more sugar that does not turn to starch quickly are all possible through research, he said.

Although more studies are needed before irradiated foods are on supermarket shelves, Dr. Shaw believes irradiation is economically feasible as a way to give fresh foods a longer useful life.

Tests with fruits, vegetables and meats show that antibiotics are effective in controlling many of the organisms that cause rotting, discoloration, shriveling and both internal and external spoilage.

The next big development in the food-processing industry will come in the field of concentrated products, Dr. Shaw said. At the USDA, the main emphasis is on the development of a dry whole milk that will taste like fresh milk, store well and dissolve instantly when water is added. Already USDA scientists have developed several fruit and vegetable juice powders that have their natural, full flavor.

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CHEMISTRY

Chemistry Aids Health

Advances in chemistry ranging from clues to the causes of rheumatoid arthritis to new stimulants hold the promise to better health.

➤ A NUMBER of substances have been found in the blood which may offer a clue to the mysteries of rheumatoid arthritis.

Blood samples taken from some of the 4,000,000 Americans afflicted with the disease have revealed that the rheumatoid factor is composed of several closely related proteins, Dr. Ralph Heimer reported to the American Chemical Society meeting in Chicago.

Study of these rheumatoid factor proteins "might offer a clue to the unknown cause of the disease," Dr. Heimer, a biochemist at the Hospital for Special Surgery, New York, said.

At least three different proteins were found, all in extremely small amounts. As little as one seventy-thousandth of the total circulating serum protein in arthritic blood was found to be made up of these special proteins.

The newly identified proteins resemble some of the unusual proteins associated with other diseases, such as hepatitis, syphilis and certain kind of anemias. They also seem related structurally to the common antibodies found in the blood.

It seems, Dr. Heimer pointed out, that the rheumatoid factor proteins may be auto-immune bodies. These are substances manufactured by the individual in defense against his own body materials which have been altered through disease.

"The response by the body to its own products, while also perhaps a protective device, proves under many circumstances to be disadvantageous," the scientist said. Auto-immune bodies apparently play a role in some diseases related to rheumatoid arthritis.

New sensitive isolation techniques, one protein was detected although only one three-billionth of an ounce was present, are expected to aid greatly studies of rheumatoid arthritis.

Olga M. Federico and Dr. Richard H. Freyberg, also of the Hospital for Special Surgery, were co-authors with Dr. Heimer of the report.

Germ Detection

➤ A CHEMICAL means of detecting deadly germ warfare agents has been developed.

The same technique can also be used to detect pollen in the air, Dr. Carl O. Thomas, Bell Telephone Laboratories, Murray Hill, N. J. told scientists at the meeting.

The germ warfare agents would reveal themselves to Army chemists only indirectly as hydrogen cyanide. Germs, which are composed of protein, form hydrogen cyanide when heated in glass tubes at 600 degrees to 900 degrees Fahrenheit, Dr. Thomas explained.

The cyanide gas would be detected by normal chemical means.

He emphasized that the method, developed several years ago under an Army contract at Southern Research Institute, Birmingham, Ala., and only recently declassified, is not necessarily the technique that actually would be used for protection against germ warfare.

Since many other protein substances are normally present in the air, he pointed out, technicians using the new technique will have to maintain a background count, and then watch for sudden increases in atmospheric protein count which could be attributable to germ warfare agents.

In experiments, Dr. Thomas reported, ". . . it was possible . . . to detect a few millionths of an ounce per cubic foot of air. Thus the method provides a very simple, sensitive, and rapid technique for indicating the presence of bacteriological warfare agents in the air."

Since pollen is protein, it also can be detected by the method, he said.

Promising Stimulants

➤ CHEMICALS related to the rocket fuel, hydrazine, have shown powerful stimulating action against depression and fatigue in laboratory animals.

Extensive clinical trials of the most promising member of the group, 1-phenyl-2-propyl hydrazine, for treatment of the depressed state in human beings are underway. The chemical's code name is JB-516, Dr. John H. Biel, chief of the chemistry division of Lakeside Laboratories, Milwaukee, told the American Chemical Society.

The new agents act by directly stimulating the central nervous system and by blocking the brain enzyme that destroys adrenalin and other activating hormones. Enzymes are naturally occurring chemicals that control the speed of body processes.

JB-516 has been shown in laboratory tests to inhibit the brain enzyme for an entire week.

One shortcoming of drugs now used to treat depression in humans is that the chemicals are rapidly destroyed by the body's enzyme system. They also tend to lose their effects on repeated administration, to have undesirable depressing after-effects, to decrease appetite, and to increase blood pressure and pulse rate, Dr. Biel said.

The new hydrazine-related chemicals produce a prolonged effect with no following period of depression, tend to lower blood pressure and increase appetite.

Dr. Alexander Drukker, senior research chemist of Lakeside Laboratories, was co-author of the report.

Beans Contain Vitamin C

➤ BRITISH "limeys" or sailors, might have been known as "beanies" instead, if the Royal Navy had known years ago something that was revealed to chemists.

Instead of avoiding scurvy by sucking limes to obtain vitamin C, they could have obtained the vitamin by eating sprouted beans, Dr. Albert A. Dietz of the Toledo (Ohio) Hospital Institute of Medical Research reported.

The biochemist said many grain-type animal feeds are considerably improved nutritionally by allowing them to germinate, or sprout, before using them.

He also questioned whether vitamins, proteins or enzymes developed in the foods during sprouting would be destroyed by refining the cereal foods for human consumption.

He reported that laboratory studies on animals have shown sprouted feeds to be more nutritional than the same grains, but not germinated.

Oats and barley showed the greatest effects from being allowed to sprout before being used as feeds. Germination had smaller effects on corn and wheat, and frequently the sprouted grain did not support animal nutrition as well as ungerminated ones.

Dr. Dietz emphasized that his studies were based only on one method of testing nutritional values, and he does not necessarily advocate only germinated cereal as a diet.

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ENTOMOLOGIST

Parasite Fly May Mean Control of Grasshopper

➤ A FLY that can take the "hop" out of a grasshopper may mean control of this pest is possible without using insecticides.

In a limited area in central California, the fly has destroyed so many grasshoppers that it has virtually wiped them out, W. W. Middlekauff, entomologist at the University of California College of Agriculture in Berkeley, reported.

The female fly deposits a larva in the grasshopper's leg muscle through a fang-like tube on her lower abdomen. The larva eats its way through the grasshopper's body until, in about six days, it emerges leaving its victim hollowed out and dead. The half-inch larva transforms into an adult fly in four more days.

Although many wasps and bees have adapted themselves as parasites, Mr. Middlekauff pointed out that it is rare among this group of flies. Some flies, such as the screwfly, deposit their eggs in open wounds but few will attack healthy living animals or insects.

The scientist plans to investigate possibilities of exporting the fly to other parts of the world where grasshoppers and locusts are a serious agricultural problem.

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MEDICINE

Plasmin Dissolves Clots

Plasmin, an enzyme in blood plasma, from human donors has been successfully used in animal experiments to dissolve blood clots.

➤ HUMAN PLASMIN has successfully dissolved blood clots in the blocked arteries of experimental animals.

This may lead to a possible solution to the difficult problem of blood clot formation during surgery of the arteries, Drs. J. Leonel Villavicencio and Richard Warren of the Department of Surgery, Harvard Medical School, speculated at the meeting of the American College of Surgeons in Chicago.

The team of doctors induced arterial clots in the animals and then injected the human plasmin, an enzyme in blood plasma. Blood flow appeared within from 11 to 27 minutes after the injection.

In several cases new clot formations were noticed when the injections were discontinued.

Additional progress in attaining a satisfactory replacement for a cancerous or damaged windpipe was also outlined at the meeting by Lt. Col. William H. Moncrief Jr. and Capt. Joseph E. Salvatore of the Walter Reed Institute of Research and Walter Reed Medical Center, Washington, D. C.

The synthetic trachea prosthesis must meet these standards: Permanency, proper fit between the cut ends of the windpipe, enough rigidity so as not to collapse on intake of air, and yet enough elasticity to provide some "give."

What had been expected to be an ideal plastic replacement was found to lose its elasticity after three months of implantation, the Walter Reed team reported.

The substance is a liquid plastisol, polyvinyl chloride, that can be fused at temperatures of 350 to 400 degrees Fahrenheit. It is flexible enough but tough. However, new methods of prolonging the elastic life of the substance will require further investigation.

So-called plasticizers can be added to produce pliability, but these tend to leach out, leaving a non-pliable material.

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OBSTETRICS

One of Every 15 U. S. Births Is Premature

➤ ONE OF EVERY 15 babies now born in the United States is premature, but each has a chance for survival today.

Nevertheless, one-fourth of these babies, particularly the smallest infants, face life with some degree of brain impairment.

Only 20 years ago, a baby born three months early had little chance of survival. Today, the same baby has a 25% chance to live, despite the fact that he probably weighs less than two pounds. Babies weighing two or more pounds have a 72% chance of survival.

Some of the more important factors involved in the care and treatment of premature babies include supplying the correct amount of oxygen to prevent brain damage, special nourishment for underdeveloped digestive tracts, prevention of jaundice due to underdeveloped liver, a supply of heat and a regulated temperature control for the incubator itself, and a strict antiseptic atmosphere.

Much of the progress in solving these problems that has led to a higher survival rate for premature infants has been the result of the work of Dr. William A. Silverman, director of Babies Hospital nursery for premature infants in New York. The American Academy of Pediatrics will award Dr. Silverman their highest honor in Chicago on Oct. 21.

Presently, Dr. Silverman is probing into the answer to the question of proper temperature conditions for the premature. A report of the Columbia-Presbyterian Medical Center has described Dr. Silverman's part in determining that oxygen can cause eye damage. He also found that administration of sulfa drugs to premature infants threatened by infection actually produced brain damage.

By coming into the world too soon, the premature infant has rolled back a curtain to reveal some of the hitherto impenetrable mysteries of the development before birth.

Defects recently thought to be the result of the immutable genes are now known to be caused by environmental accident.

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● RADIO

Saturday, Oct. 25, 1958, 1:35-1:45 p.m., EDT "Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. William E. Davies, geologist, U. S. Geological Survey, Washington, D. C., and recently president of the National Speleological Society, will talk on "Exploring Caves".

SEISMOLOGY

Record Waves From Blast 7,000 Miles Away

➤ A SEISMOGRAPH can detect a nuclear explosion even when it takes place nearly a third of the way around the earth.

In what "is apparently the first report of surface waves (from nuclear blasts) at large distances from surface or elevated sources," Drs. Jack Oliver and Maurice Ewing of Columbia University's Lamont Geological Observatory, say that Observatory seismographs recorded surface waves from nuclear test blasts in the Marshall Islands, more than 7,000 miles away.

There is a great similarity between natural and nuclear explosion-generated earthquake waves, the scientists point out in the *Proceedings of the National Academy of Sciences* (Aug.). Studies of one should provide information about the other.

Earthquake interference prevented detection of one explosion. However, explosion-generated waves from another test shot were identified in spite of earthquake interference.

All the information gathered at the Observatory was from explosions on or above the earth's surface, the scientists report. No surface waves were recorded from the underground explosion in Nevada September, 1957.

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SEISMOGRAPH STUDY—Dr. Maurice Ewing, director of Columbia University's Lamont Geological Observatory at Palisades, N. Y., checks seismograph records at the Observatory.

MEDICINE

Infant Without Forebrain Behaves as Normal Baby

➤ BORN WITHOUT a forebrain, a British infant lived three months and behaved much like any normal newborn.

A film record of the unusual baby's short lifespan showed that its feeding, moving and yawning movements appeared normal. On occasion, it even sat up.

The film was shown in Oxford, England, at the first international study group on child neurology, sponsored by the British National Spastics Society.

Most of the 50 attending experts seemed to believe the child's behavior indicated that normal infants behave more automatically than was hitherto realized. The forebrain (cerebral hemispheres) the filmed baby was missing is present in many animals, but its massive size is the most outstanding feature of the human brain.

Dr. J. D. Boyd, professor of anatomy at the University of Cambridge, reported a discovery which makes it far more easy to comprehend the normal and abnormal development of the forebrain.

It has always been difficult to understand why the forebrain can develop abnormally while other parts of the brain have grown in the normal fashion. Dr. Boyd revealed that its growth is controlled by a separate system of growth controllers from those that guide the emergence of the rest of the central nervous system.

Further light on the workings of the brain of the newborn baby was shed by Dr. Alex Minkowski in a report of his recent researches. As director of the Center for Biological Research on the Newborn, in Paris, he has been doing research on the brain waves by making electroencephalographic studies in infants born six months, seven months, eight months after conception, and in full-term infants.

Dr. Minkowski's records show a progressive development up to eight months after conception. The normal brain waves at different ages are now known. Deviation from these may enable experts to recognize early the children who are likely to need special care and teaching.

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ANTHROPOLOGY

Mau-Mau Uprisings Alter Kikuyu Way of Life

➤ AS A RESULT of the Mau-Mau uprisings, a whole new way of life has developed among the Kikuyu people of Africa.

This is the observation of Dr. Benjamin E. Thomas, associate professor of geography at the University of California at Los Angeles, who recently returned from Kenya, British East Africa.

He said almost all the rural Kikuyu were moved from isolated huts or hamlets into large villages so that the British could protect them from the Mau-Mau. The British also wished to keep the terrorists from operating from numerous isolated buildings.

"Roads were built to all the new large villages," Dr. Thomas said. "And as a result, the Kikuyu settlements, in the space of a few years, were changed from isolated ones to accessible ones."

While this "villagization" made possible many improvements, such as in education, health, etc., it created new problems. The Kikuyu farmer, although moved to a new home in a village, still retained his old fragmented landholdings. These often consisted of five or ten small plots accessible only by paths across other people's land.

The UCLA geographer noted that a land consolidation program is rapidly gaining acceptance and is radically changing the patterns of land ownership and land use. The Kikuyu are beginning to consolidate the fragmented holdings so that each landowner has a single farm bordering a good road.

"Thus," he concludes, "there has been a 'revolution' in access to transportation in Kikuyuland. Few places in the world have seen such a rapid and widespread change from isolation."

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MEDICINE

"Mimic" Lung Infection Found Among U. S. Youth

➤ A LUNG INFECTION that is difficult to diagnose because it "mimics" other diseases, has been found in more than one-third of the young adults in some areas of 22 of the United States.

More than 30,000,000 Americans probably have the disease, histoplasmosis, Dr. Michael L. Furcolow of the Government's communicable disease center at the University of Kansas Medical School, reports in *GP* (Oct.), the publication of the American Academy of General Practice.

Histoplasmosis was regarded as a rare and usually fatal disease until 1945. Now it has been found in 22 states that center on the Missouri, Mississippi and Ohio river valleys. The fungus that causes the disease grows best in damp, shady areas and in soil that has a high organic content, the physician explains. Favorite spots are chicken coops, pigeon roosts, caves, storm cellars and silos.

The lung infection "mimics other diseases," including the common cold, flu, typhoid fever and tuberculosis. At least one antibiotic seems to be effective against the infection while others are being developed and should be available soon.

Many sufferers of histoplasmosis show no apparent symptoms, thus explaining the difficulty in diagnosing or discovering the disease. In mild cases, the patient may have trouble describing the symptoms. He usually runs a fever and just does not "feel good." There may also be chest pains or a cough. These cases last from one to three days and resemble most closely a case of flu.

In moderately severe cases, the symptoms are much the same but coughing and chest pains are not as common. It is impossible to draw the line between severe cases of flu and moderately severe cases of histoplasmosis, Dr. Furcolow says. The condition usually lasts 10 to 15 days but leaves the patient feeling out of sorts for several days or weeks. The disease is not contagious.

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IN SCIENC

EDUCATION

"All-American" Learning May Discourage Gifted

➤ EDUCATION systems overemphasizing the "well-rounded all-American youth" may be discouraging some of the most gifted students.

If the bright student does not fit into a "round mold," perhaps we should let him have "a few sharp edges," a National Education Association report suggests.

The report details the findings of a national conference on the academically talented held in Washington last February under the chairmanship of James B. Conant, president-emeritus of Harvard University.

The report lists the following recommendations made by the national conference.

1. A solid four-year high school course of the academic subjects, science, English, math, modern foreign languages and social studies. The students should be grouped in classes with others of similar abilities.

2. A rigorous counseling program, with guidance based on aptitude and/or intelligence test scores and school records.

3. Special provisions within regular high schools for advanced work. Talented students should take extra courses in summer school. An advanced program should be in effect in many schools to allow talented students to enter college with credit toward graduation already established.

4. Advanced work for talented students on a lower grade level. For example, ninth grade algebra should be available to superior students in the eighth grade.

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CONSERVATION

Satellite Towns Could Preserve Countryside

➤ THE SUCCESSFUL CONSTRUCTION of satellite towns that preserve all of the beauty of the countryside can be accomplished by the concerted efforts of officials, experts, citizens and newspapers, Edward J. Meeman, editor of The Memphis Press-Scimitar said, speaking before the National Conference of State Parks meeting, Davis, W. Va.

Interest in the Great Smoky Mountains National Park was sparked by conservationists, Mr. Meeman said, and the same method of handling such a project could be employed in the formation of satellite towns, where the city can move into the country without destroying the beauty and peace of nature.

The planning of such suburban, exurban and rural areas is the great present challenge to the joint efforts of conservationists and planners. Depressing "urban sprawl," Mr. Meeman said, could move to the country as a conserver rather than a destroyer of beauty and peace.

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CE FIELDS

MEDICINE

Physician Shortage In U. S. Hospitals

➤ DESPITE AN INCREASE in the number of interns and residents serving in American hospitals, some of these positions still go begging.

Approximately 7,000 students were graduated from American medical schools in 1957. There were 12,325 internship positions to be filled. About 5,000 of these either remained vacant or were filled by graduates of foreign medical schools, the Council on Medical Education and Hospitals of the American Medical Association reports in the *Journal of the American Medical Association* (Oct. 4).

Of the available internship positions, 17% actually remained unfilled. In addition, although the number of residents also increased over the previous year, 18% of the positions offered were not filled, council members Drs. Arthur N. Springall, John Hinman and Willard V. Thompson point out. Their report is based upon data representing the intern and residency situation on Sept. 1, 1957.

The number of hospitals and other institutions offering graduate training increased from 1,372 to 1,400 last year.

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VIROLOGY

Volunteers Help in Tests With New Virus

➤ WITH THE HELP of volunteers, a virus, already pinpointed as the cause of respiratory illness in children, has now been found to cause the same illness in adults.

There is evidence that the virus, one of two new hemadsorption types, may be responsible for a substantial amount of influenza-like or "cold-like" illness in many communities.

An experiment in which volunteers had their throats swabbed and sprayed with the virus showed a correlation between illness and the occurrence of a virus infection, a team of scientists reports in *Science* (Oct. 3).

Of the 32 male volunteers, 25 had antibodies to the virus prior to infection. However, 18 developed illness after about one week. All except one man was found to have been infected with the virus.

An interesting discovery made in the study was that there is apparently a long incubation period before the illness "shows." This could be either a property of the virus or a result of using only a small quantity of the virus, the scientists report.

When clinical symptoms, such as nasal obstruction and discharge, coughing, and sneezing, failed to appear by the fifth day, the volunteers were released from isolation. On the next day, six men complained of illness and all were returned to isolation. Examination revealed many had the beginnings of respiratory illness on that day. Furthermore, about one week after the volunteers' premature release, other individuals became ill with a mild "cold-like" illness.

For the most part, the scientists report, the illness was mild, with "prompt and uneventful recovery occurring within two to three days."

Drs. Thomas E. Reichelderfer, Robert M. Chanock, John E. Craighead, Robert H. Huebner, Horace C. Turner and Walter James of the National Institutes of Health, Bethesda, Md., and Dr. Thomas G. Ward of the Lobund Institute, Notre Dame University, report the research. The volunteers, from 21 to 46 years old, were inmates at the Maryland State Board of Correction's Patuxent Institution at Jessup, Md.

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AERO-MEDICINE

Apparatus May Achieve Gravity-Free State

➤ A NEW APPARATUS to duplicate for several hours the gravity-free state, which future space travelers will experience, can be built at relatively small cost.

Dr. H. J. Muller, Nobel-Prize winning zoologist of Indiana University, reports in *Science* (Oct. 3) that only a short time would be needed to construct the apparatus. It resembles the mechanism used for nullifying gravity in studies on plants, called a clinostat.

Dr. Muller says his suggested combination of "relatively simple devices" would enable scientists to obtain information on the effects of simulated weightlessness maintained for at least a number of hours. This information would thus be available long before the costly direct tests of human reaction to free fall can be carried out by Western scientists.

In the apparatus suggested by Dr. Muller, human volunteers would lie down in a cylinder that would be given a moderate spinning motion about the horizontal axis. The entire body would be enclosed in a skin-tight envelope and immersed in a salt solution having the same specific gravity as the body itself.

The volunteer's head would be encased in a transparent helmet with arrangements for breathing and talking. It would have to be held in the same horizontal axis alignment as the rest of the body but could otherwise be moved. The arms and legs, however, would have considerable freedom of movement.

Dr. Muller suggests that the volunteers, thus under simulated weightless conditions, be given a view, such as room furnishings and a window showing a skycrape, arranged so that it remained in a fixed position with reference to the subject.

Questions that might be answered through use of such apparatus include how individuals differ in their tolerance to free-fall conditions, and in their reactions to the effects of various physiological conditions and diverse drugs when weightless.

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PUBLIC HEALTH

Every Third American Harbors TB Germ

➤ ONE OUT OF EVERY three Americans harbors tuberculosis germs that can, under unfavorable conditions, produce active tuberculosis.

Last year alone TB was responsible for 14,000 deaths.

Eventual control of the disease depends upon preventing those now infected with the germ from breaking down into active TB.

Tuberculosis is found most often today in the following groups as listed in the annual report of the National Tuberculosis Association: among persons admitted to general hospitals, correctional and mental institutions and jails; among lower income groups, such as homeless men, those receiving public assistance, and older people in nursing homes and welfare institutions; migrant workers; certain racial groups, and densely populated areas.

The tuberculin test has become the most valuable universal tool for detecting tuberculosis infection, Dr. James E. Perkins, managing director of the TB Association in New York, said. This is a skin test that reveals the presence of tuberculosis infection but does not indicate whether the disease is active. The latest trend has been toward chest X-ray follow-up only for those persons that react to the skin test.

Although new drugs, advances in surgery and modern hospital facilities result in more and quicker recoveries, tuberculosis remains a long-term illness, treatment in most cases requiring at least one year.

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MEDICINE

Birth of Large Infants May Indicate Diabetes

➤ MOTHERS OF BABIES that are abnormally large at birth are advised to begin a program of regular examinations and planned dieting to avoid developing diabetes.

It has long been suggested that the birth of a large baby foreshadows the development of diabetes in the mother, according to an article in *Nutrition Reviews* (Oct.), published by the Nutrition Foundation, Inc.

The article refers to several investigations supporting the theory that mothers giving birth to babies who weighed about eight and one-half or more pounds are likely to develop diabetes.

One explanation suggested for the development of diabetes in mothers after the birth of large babies centers around the theory that women who have excess activity of the anterior pituitary produce excess growth hormone, thus explaining the infant's large size. The excess hormone may also be responsible for diabetogenic activity and the eventual development of diabetes in the mother.

Of 27 mothers tested after delivery of large infants, 15% had abnormal blood sugar levels following a glucose test.

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CHEMISTRY

Breath of Life for Defense

The oxygen in ordinary air has become the single most important chemical for defense. Man has improved on nature by concentrating and collecting it in its liquid form.

By DAVID PURSGLOVE

➤ THE AIR we breathe is today the most important single chemical used by industry and in national defense.

Just as most of nature's own important chemical reactions involve the combination of substances with oxygen from the air, the push for a guided missile, the conversion of iron to high grade steel, the creation of a chemical explosion, the conversion of otherwise useless gases and liquids to valuable materials, all depend on a combination of substances with oxygen.

Oxidation processes in nature generally are slow. However, scientists believe that when the earth was in its earliest days and abounded with many highly reactive chemicals that today are found only in laboratories, reactions between these elements of the earth's crust and oxygen of the atmosphere took place rapidly, with the liberation of heat and light.

Liberating Energy

Today we deliberately foster combustion between gasoline and oxygen in the automobile engine and between alcohol or other fuels and oxygen in the rocket engine. The energy thus liberated is put to work for us.

In many important oxidation processes we steal a march on nature by concentrating our oxygen as the pure element, undiluted by nitrogen and inert gases of the atmosphere, for more efficient use.

Sometimes it is compressed in steel cylinders—familiar red or green "bottles" found in hospitals and some factories.

The trend in industry now, however, is to store the greatest amount of oxygen in the smallest space by compressing and cooling it until it becomes a liquid.

Liquid oxygen used at steel mills and in chemical processing is the same famous LOX found near many missile launching sites.

It is easy to see why industry and the armed forces are devoting millions of dollars and countless hours of scientists' time to develop increasingly better facilities and techniques for producing oxygen as a liquid. To store or ship one pound of the gas compressed at a pressure of 2,400 pounds per square inch requires a container weighing more than five pounds. However, the same pound of oxygen stored or shipped as a liquid needs a container weighing only about three-quarters of a pound.

Besides the saving in container weight, liquid oxygen also saves considerable space as contrasted to gaseous oxygen. A container of a given size will hold 800 times as much oxygen in liquid form as in gaseous form.

Since the liquid boils at 297 degrees below zero Fahrenheit, it must be shipped in a constantly refrigerated container called a Dewar flask. These, on a larger scale, resemble the common vacuum bottles sold under the trade name of Thermos flask.

Because liquid oxygen always expands to 800 times its liquid volume, pipelines and pumps used to transfer LOX from storage to its point of use must be capable of withstanding very high pressures as the oxygen "warms" up to its sub-zero boiling point.

The chief interest in liquefying oxygen is to facilitate its storage and transportation. With the exception of very small quantities for low-temperature laboratory experiments, oxygen is used as a gas. However, in most operations it becomes gaseous only in the last instant before use.

Oxygen, whether stored as a liquid or as a gas, has hundreds of important uses in national defense and commerce. Chief among them is its role as the more important half of the oxygen-acetylene torch for welding metal together and cutting it apart. Many fuels besides acetylene will work in a torch, but oxygen almost always is present on the team.

Huge quantities of oxygen are consumed each year in the production of synthetic sapphires for industry and in the preparation of hydrogen peroxide. Some processes for manufacturing ammonia, ethylene for plastics and other important "starting-point" chemicals depend upon oxygen.

One of the fastest growing uses for oxygen is in the processing of steel by the comparatively recent oxygen converter process.

Although this new technique of steelmaking is accountable for only a small portion of the steel produced in the U. S., it is rapidly coming into favor. It was developed in Europe. Its fundamental difference from the Bessemer converter process is that a jet of pure oxygen is blown directly down on the molten charge of iron to literally "burn out" carbon and other impurities. In the Bessemer process, a stream of ordinary air is blown up through the iron bath.

Oxygen Converter Process

The oxygen converter makes high-quality, low-carbon steel as rapidly and as economically as the Bessemer process does. In addition, the oxygen converter offers the quality of steel that is produced by the open hearth process.

The producing, cutting and welding of iron and steel is the chief use of compressed or liquid oxygen today in the U. S., the most glamorous is in missiles.

Whereas air-breathing engines, as their name implies, draw oxygen for combustion from atmospheric air, rocket engines operating far above our normal atmosphere must carry their own oxygen with them. Even rocket engines designed for use at low altitudes carry concentrated oxygen for per-

OXYGEN AT WORK—Oxygen finds its biggest role in the oxygen-acetylene blowtorch used either for welding metal together or cutting it apart. Such a torch is shown being used to scrap a powerhouse in New York.

formances far superior than could be expected with the diluted oxygen in ordinary air.

In the missile field and some industrial operations, oxygen has become so important that it is produced or separated from the atmosphere at the launching site or industrial plant rather than being shipped from an air-reducing facility.

For example, Air Reduction Company, Inc., New York, is building a new 120-ton-per-day oxygen facility at Armco Steel Corporation's new Butler, Pa., plant to provide the vast amount of high purity oxygen needed for that operation. It would be too costly, time-consuming and almost foolhardy to ship such vast quantities of oxygen long distances from production centers when a plant can be built adjacent to the factory.

Supreme Chemical

Oxygen's supremacy in the chemical industry has not been without a struggle against older, "traditional" ways of doing things. And, it appears its supremacy could just as easily be lost as oxygen in turn bows to further progress.

In the missile field, as an example, some more powerful or easier-to-handle oxidizing agents than oxygen itself are being developed.

"Oxidizing agent" and "oxidation" are terms arisen from the early days of chemistry that now describe a type of electron transfer to certain chemical reactions. Fluorine, for instance, is representative of several powerful oxidizing agents that may see wide use in missiles.

Nitrogen tetroxide is another bidder to replace LOX in rockets. It is easier to handle, requires no refrigeration and reacts spontaneously upon contact with many fuels.

New processes for making steel might replace the recent oxygen converter process even before that technique gets its feet off the ground. Steel companies are looking into every research nook and cranny for means of reducing their costs and increasing production.

There was a time when production figures for all-important sulfuric acid were considered the single reliable bellwether of a nation's economy. A few people believe that ubiquitous oxygen has replaced sulfuric acid as the best single indication of national wealth and industrial progress.

Science News Letter, October 18, 1958

ASTRONAUTICS

U. S. Sends Rocket High Above Earth

➤ A UNITED STATES attempt to orbit a man-made satellite around the moon has resulted in a successful launching of a rocket that has broken through all past records for height, the U. S. Air Force reported.

On Saturday, Oct. 11, the Pioneer rocket was launched at Cape Canaveral, Fla., at 4:42 p.m. E.D.T. It soared to an altitude of 79,316 miles, more than a third of the distance to the moon, and then started falling back to earth. Scientists report receiving valuable information about outer space from the launching.

(See SNL, Aug. 16, p. 101, Aug. 23, p. 114 and May 24, p. 323.)

Science News Letter, October 18, 1958

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ANTHROPOLOGY AS A CAREER—William C. Sturtevant—*Smithsonian*, 18 p., paper, 20¢. Describes the major subdivisions of the science, with advice on courses for students.

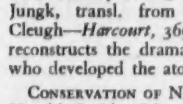
BIBLIOGRAPHY AND INDEX OF LITERATURE ON URANIUM AND THORIUM AND RADIOACTIVE OCCURRENCES IN THE UNITED STATES, Part 5—Margaret Cooper—*Geological Soc. of Am.*, 472 p., paper, $6.75.

BIRDS OF MARYLAND AND THE DISTRICT OF COLUMBIA—Robert E. Stewart and Chandler S. Robbins—*Govt. Printing Office* for Fish and Wildlife Service, 401 p., maps, paper, $1.75. Describes birdlife in terms of its geographical, ecological and seasonal distribution.

BRIGHTER THAN A THOUSAND SUNS: A Personal History of the Atomic Scientists—Robert Jungk, transl. from the German by James Cleugh—*Harcourt*, 369 p., $5. A reporter here reconstructs the dramatic story of the scientists who developed the atomic bomb.

CONSERVATION OF NATURAL RESOURCES—Guy-Harold Smith, Ed.—*Wiley*, 2nd ed., 474 p., illus., $8.50. Nineteen specialists survey the present needs, aims, methods, and accomplishments of conservation in the U. S.

ENJOYING AMERICA'S GARDENS—Joan Parry Dutton—*Reynal*, 311 p., illus., $5. A tour through the great gardens, arboretums and natural wild flower preserves across the country.



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GENERAL CHEMISTRY WORKBOOK: How to Solve Chemistry Problems—Conway Pierce and R. Nelson Smith—*Freeman*, 2nd ed., 246 p., illus. by Evan Gillespie, paper, $1.75. First college course in chemistry.

INTRODUCTION TO PHOTOGRAPHIC PRINCIPLES—Lewis Larmore—*Prentice-Hall*, 229 p., illus., $8. Scientific laws of photography together with their practical applications.

LIVING BIRDS OF THE WORLD—E. Thomas Gilliard—*Doubleday*, 400 p., 400 photographs, 217 in full color, $12.50. General survey of 1,500 species of birds, from primitive to highly developed. Exquisite photography.

MACHINES—Jerome S. Meyer—*World Pub. Co.*, 64 p., illus. by John Polgreen, $2.50. Introduces in simple language the principles of the wheel and axle, the lever, the screw, and the wedge. For ages 9 to 14.

METABOLIC DISTURBANCES IN CLINICAL MEDICINE—G. A. Smart, Ed.—*Little*, 358 p., illus., $10. For the physician who has not specialized in this aspect of medicine. Bibliographies included.

THE NINE PLANETS—Franklyn M. Branley—*Crowell*, 77 p., illus. by Helmut K. Wimmer, $3. Distance, temperature, size, speed, inclination, mass and density of each planet are clearly explained.

THE OPERATION—Leonard Engel—*McGraw*, 277 p., illus., $4.95. A minute-by-minute account of a heart operation, and the story of medicine and surgery that led up to it.

A PERIODIC TABLE FOR FUNDAMENTAL PARTICLES—John J. Grebe—*N. Y. Acad. of Sciences*, Annals, Vol. 76, Art. 1, 15 p., illus., paper, $1.50. Analysis of data and a possible sequence of geometric configurations based upon it.

PRINCIPLES OF QUANTUM ELECTRODYNAMICS—Walter Thirring, transl. from the German by J. Bernstein—*Academic*, 234 p., $8. With corrections and additions by the author.

PROGRESS REPORT ON SCIENCE PROGRAMS OF THE FEDERAL GOVERNMENT: Senate Report No. 2498—Subcommittee on Reorganization and International Organizations, Hubert H. Humphrey, Chairman—*Govt. Printing Office*, 64 p., paper, 25¢. A summary of legislative and administrative actions taken to implement the Science and Technology Act of 1958.

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RECOMMENDED METHODS FOR THE MICROBIOLOGICAL EXAMINATION OF FOODS—Harry E. Goresline, Ed., preface by Ferdinand R. Hassler—*Am. Public Health Ass'n*, 207 p., $4.50. Manual for public health laboratory personnel.

SCIENTIFIC ACTIVITIES IN SIX STATE GOVERNMENTS: Summary Report on a Survey, Fiscal Year 1954—National Science Foundation—*Govt. Printing Office*, 62 p., graphs, paper, 40¢. Based on studies in California, Connecticut, New Mexico, New York, North Carolina, and Wisconsin.

STAMP CURIOSITIES—R. J. Sutton—*Philosophical Lib.*, 285 p., illus., $6. A tour of the world portrayed in stamps, from Afghanistan to Zanzibar.

STATUS TERMINOLOGY AND THE SOCIAL STRUCTURE OF NORTH AMERICAN INDIANS—Munro S. Edmonson—*Univ. of Wash. Press*, 84 p., $3. A study of the way some American Indians look at their own societies.

THE STRUCTURE OF STEEL: A Simple Explanation for Students, Engineers, and Buyers of Steel—Edwin Gregory and Eric N. Simons—*Philosophical Lib.*, 176 p., illus., $10.

SURGICAL CONVALESCENCE—F. Curtis Dohan, Ed.—*N. Y. Acad. of Sciences*, 155 p., illus., paper, $4. Monograph makes investigations in this field available both for further research and for practice.

TALANTA: An International Journal of Analytical Chemistry, Vol. I, Nos. 1 & 2—C. L. Wilson, Editor-in-Chief—*Pergamon*, 196 p., illus., paper, quarterly, annual subscription $17.

TAN'S FISH—Ruthven Todd—*Little*, 58 p., illus. by Theresa Sherman, $2.75. Charming story for children about a Cantonese boy who found a rare tropical fish.

TECHNICAL DRAWING—Frederick A. Giesecke, Alva Mitchell and Henry Cecil Spencer—*Macmilian*, 4th ed., 844 p., illus., $10. Standard reference for the engineering draughtsman.

TELEVISION FACTBOOK, FALL-WINTER 1958: The Standard Reference of the Television & Associated Electronics Arts and Industries—*Television Digest*, 492 p., map, paper, $5.

THEORETICAL ELECTROMAGNETISM — W. R. Myers—*Butterworth (Canada)*, 274 p., illus., $8.50. Introductory course for physics students.

WIDER THAN THE SKY: Aviation as a Career—Charles Michael Daugherty—*Harcourt*, 158 p., illus., $2.95. Traces the development of aviation and stresses present opportunities in this field for young men and women.

WILD TREASURE: The Story of David Douglas—Adrien Stoutenburg and Laura Nelson Baker—*Scribner*, 216 p., $2.95. Biography of the Scottish botanist who has given his name to the Douglas fir. For teenagers.

THE WORLD OF BUTTERFLIES AND MOTHS—Alexander B. Klots—*McGraw*, 207 p., 180 photographs, partly in color, $15. Describes the forms, colors, biology and natural history of butterflies. Large format.

Science News Letter, October 18, 1958

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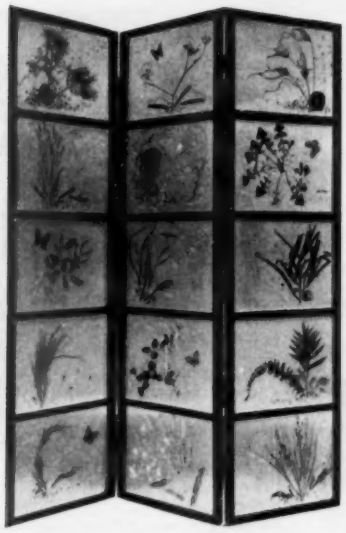

Nancy Hutchings CREATES NATURE PANELS . . . A NEW HORIZON IN CRAFT WORK . . .

This fine Bermuda artist is widely known for her lovely and highly original glass panel designs. She works with native materials indigenous of the island . . . Bay grapes, ferns, thistles, bamboo, sea fans, shells, star fish, sea horses, butterflies and many others.

Each of the panels is a completely original design. These she blends with rare sensitivity into a strikingly beautiful overall design. No two are ever alike. Examples of her work shown here add a graceful note to homes and offices and fine hotels in Bermuda, New York and Connecticut.

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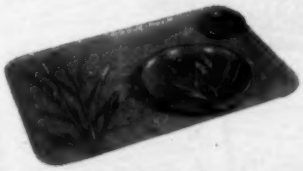
A hardening agent is mixed with the liquid plastic which is then applied to glass or used to impregnate fiberglass fabric of various types. It sets hard within 30 to 60 minutes at room temperature. Basically, that is all there is to it . . . except for the design. Your imagination and creative craftsmanship enable you to make your own screens or room dividers, door panels, lamp bases and table decorations, individually made to reflect your taste and personality, to blend harmoniously into your own decorative schemes. Wherever you live, you will find an abundance of materials that are native to your region and that will lend themselves beautifully to this work.

We'll be delighted to tell you more about Nancy Hutchings and her work and share with you the knowledge and skill she has learned from firsthand experience. Address your request to Dept. K-31, The Castolite Co., Woodstock, Illinois. Please enclose 25¢ to cover mailing and handling charges.



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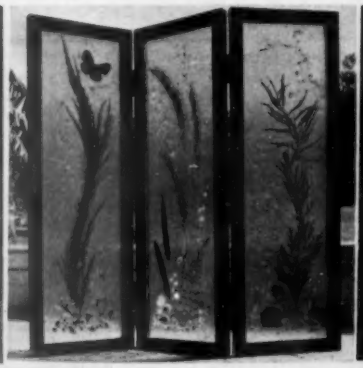

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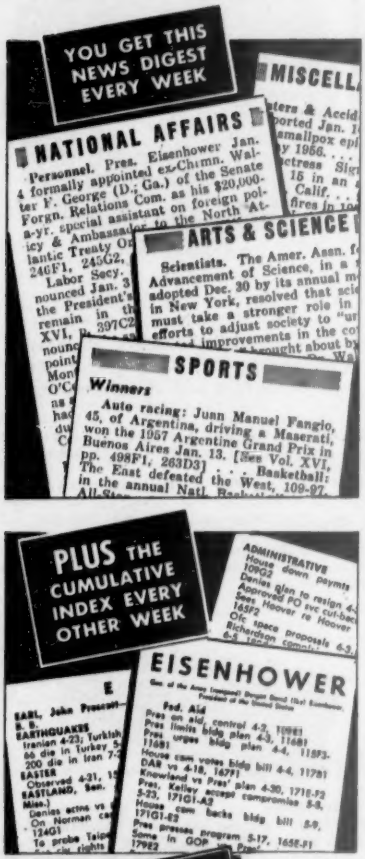

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Questions

AERO-MEDICINE—What does one projected apparatus for studying the effects of space travel on man look like? p. 249.

MEDICINE—What is plasmin? p. 247.

PHYSICS—How long does it take a pi meson to decay into a mu meson? p. 243.

Photographs: Cover, American Museum of Natural History; p. 243, National Jewish Hospital; p. 245, General Electric Company; p. 247, Columbia University; p. 250, Air Reduction Company, Inc.; p. 256, E. I. Du Pont de Nemours.

ZOOLOGY

First Corals Kept Alive Outside of the Tropics

See Front Cover

➤ THE FIRST corals ever to have been kept alive outside of their native tropics were studied in an experiment at the American Museum of Natural History, New York.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows a specimen of rose coral, *Manicina areolata*, some five inches long, with its tentacles extended ready to feed in a laboratory tank. Dr. Donald F. Squires, assistant curator of fossil invertebrates, brought the corals back from the Bahamas.

Science News Letter, October 18, 1958

Do You Know?

Losses in the Cotton Belt due to the *boll weevil* are estimated at more than $300,000,000 a year.

The *electroencephalograph* is the delicate instrument that measures the electrical activity of the brain.

Tomatoes and potatoes belong to the same family, and *potatoes* sometimes bear small, tomato-like fruits which are the "seed balls" of the potato plant.

For centuries, *storks* have been flying annually to the district of Jerez in southern Spain from Africa to build their nests and raise their young.

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❁ *COLOR-SOUND MACHINE reproduces music into dancing colors. It plays from records, tape, radio, television sound, public address systems, piano and electronic organ. Units come in large sizes that project animated colors on entire walls and sizes that can be built into custom cabinets matching other furniture.*

Science News Letter, October 18, 1958

❁ *PHOTOGRAPH KIT makes photoprints from negatives on paper, cardboard and cloth. A drop of treated fluid is spread on the object to receive the print and the negative is placed in position. A piece of glass is clipped over the negative and it is exposed to sunlight or photo-flood. The negatives are not damaged.*

Science News Letter, October 18, 1958

❁ *PAINT REMOVER conditions wet brushes so that they may be washed out in water. The fluid helps remove enamel, varnish, oil and latex paints. If the paint is hardened, the brush is kept in the fluid a few days, then the paint is worked out by hand and the brush is rinsed in water.*

Science News Letter, October 18, 1958

❁ *PLASTIC DOME is inflated like a balloon. Made of polyester film, it can be installed in less than two hours. The dome,*

shown in the photograph, is intended for such uses as covering construction crews in rainy weather, greenhouses, swimming pool covers and temporary office shelters.

Science News Letter, October 18, 1958

❁ *TARNISH-ABSORBING CRYSTALS remove the tarnishing elements from the air that discolor silver pieces, thus cutting down on silver polishing. Stored in a jar, the tiny blue crystals absorb the tarnish elements and turn a pink color. Blue color and anti-tarnishing properties are restored by placing the jar in a moderate oven for a short time.*

Science News Letter, October 18, 1958

❁ *HEAT-MASSAGE PILLOW is designed to provide therapeutic heat or a vibratory massage or both at once. It works on 115 volts, 50 watts A.C. only, and has a four-position switch. It is covered with corduroy in red, gold, blue, brown, green or black.*

Science News Letter, October 18, 1958

❁ *MECHANICAL UNIVERSE reproduces changes in the sky as seen from any location on earth. Used as a teaching aid, the instrument can determine the path of the sun at any time, length of nights and days, times of sunrise and sunset, time relationships between any points on earth, positions of stars, and various other astronomical facts.*

Science News Letter, October 18, 1958

❁ *CLASSROOM GYROSCOPE operates on 110 volts and turns at 150 rpm. It is 22 inches high, 14 inches wide and weighs 32 pounds. The precision-built instrument is intended for use in schools, colleges and industry for studies of physics and such other fields as space navigation.*

Science News Letter, October 18, 1958

Nature Ramblings

By BENITA TALL

Bird Dogs

➤ HUNTING has changed. A few generations ago the hunter supplied his household with meat. If he did not "bag" several ducks or rabbits or get a deer, the hunter could only put the day down as a failure.

Today, however, this attitude toward hunting has changed. It is still one of the top outdoor activities, but no one has to hunt for his dinner. The hunter can go and relax, enjoying the recreational values in hunting.

And one of the best aids to enjoying the hunt is a good dog.

No matter what game the hunter chooses there is a dog that has been selectively bred so that he is well-equipped for hunting that particular game animal. Hound, setter, pointer, retriever—they each have special abilities that make it possible for the hunter to choose the best dog for him.

English setters and pointers are usually the first in popularity when it comes to hunting pheasants, quail and grouse, the upland birds.

Hunting with a hard-working dog offers many thrills. Perhaps none is so great as when a pointer comes to a stiff-legged stop and, with tail held high, points out the hidden quarry. Or, if a different kind of action is desired, hunting with a beagle may be more to the hunter's liking.

These small hounds do not find and mark the game for the hunter. Instead the beagle chases it down, calling to the hunter all the time. A beagle can sniff out the game, often a rabbit, from the densest kind of underbrush or cover.

A good retriever can be a big help to the hunter and to wildlife.

By bringing in a crippled duck, for example, the dog saves it from what could be a slow, painful death. By retrieving these birds, he also saves other birds from being taken in order to fill the hunter's quota.

Just as important is the fact that the retriever actually enjoys plunging into an autumn-icy lake and bringing back the game. The hunter can stand by, dry, or reasonably so, and comfortable, enjoying the day, the hunt and his dog.

Science News Letter, October 18, 1958